

Serial No.: 10/682,229
Examiner: G. Goudreau
Title: METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of manufacturing a semiconductor device in patterning of a conductive film and a thin dielectric film, comprising the steps of:

a first etching step of carrying out anisotropic etching until most of the conductive film in a flat portion of the dielectric film disappears, the first etching step using a mixed gas including O₂; and

a second etching step of increasing a selective ratio to the dielectric film, by increasing the flow ratio of O₂ to etch the conductive film in ~~an unnecessary~~ a first desired portion of the dielectric film in a state in which the conductive film is caused to remain in a second desired portion of the dielectric film such that a thickness of the dielectric film provided under ~~the~~ a grain boundary between the conductive film and the dielectric film ~~can be held~~ provides a pattern to prevent oxidation species associated with the mixed gas from reaching an interface with a substrate after the first etching step;

wherein the second etching step is executed at an in-chamber pressure of 2 mTorr or less.

2. (Original) The method of manufacturing a semiconductor device according to claim 1, wherein the second etching step includes a step of carrying out etching while growing a silicon oxide film by a reaction of the oxidation species and the substrate.

3. (Previously Presented) The method of manufacturing a semiconductor device according to claim 1, wherein the second etching step is executed in such a gas atmosphere that a concentration of the oxidation species is higher than that in the first etching step.

4. (Cancelled)

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5. (Original) The method of manufacturing a semiconductor device according to claim 1, wherein the dielectric film is a silicon oxide film having a thickness of 5 nm or less.

6. (Previously Presented) The method of manufacturing a semiconductor device according to claim 1, wherein the conductive film is a silicon type conductive film.

7. (Original) The method of manufacturing a semiconductor device according to claim 6, wherein the silicon type conductive film is a polycrystalline silicon film.

8. (Previously Presented) The method of manufacturing a semiconductor device according to any of claim 1, wherein the first and second etching steps are ECR plasma etching steps.

9. (Original) The method of manufacturing a semiconductor device according to claim 6, wherein the second etching step uses a hydrogen bromide (HBr)/Cl₂/O₂ plasma.

10. (Previously Presented) The method of manufacturing a semiconductor device according to claim 9, wherein the first etching step uses the hydrogen bromide (HBr)/Cl₂/O₂ plasma.

11. (Original) The method of manufacturing a semiconductor device according to claim 9, wherein the first etching step uses a Cl₂/O₂ plasma.

12. (Previously Presented) The method of manufacturing a semiconductor device according to claim 1, wherein the dielectric film is a gate oxide film and the conductive film is a gate electrode.